

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

Claim 1 (currently amended): A method of efficiently processing a discrete time input signal having a plurality of input signal samples that occur at a first clock rate into a discrete time output signal having a second clock rate that is R times the first clock rate, the method comprising the steps of:

receiving the input signal; and

filtering the input signal with an N -taps finite impulse response (FIR) filter having N filter coefficients according to

$$\sum_{i=k}^{\text{ceil}[(N+1-k)/R]-1} b_{iR-k} u((m-i+k)T_s)$$

wherein b_{iR-k} is one of the N filter coefficients, and $u((m-i+k)T_s)$ is one of the input signal samples, T_s is a slow clock sampling period, m equals (0, 1, 2, 3, ...), and k equals (0, 1, 2, ..., $R-1$).

Claim 2 (original): The method of claim 1, wherein the input signal is a position signal.

Claim 3 (original): The method of claim 1, wherein each of the N filter coefficients is the result of a discrete convolution of a series of FIR filters.

Claim 4 (original): The method of claim 1, wherein the output signal is sent to a control system that controls a photolithography scanning operation.

Claim 5 (currently amended): A system for efficiently processing a discrete time input signal having a plurality of input signal samples that occur at a first clock rate into a discrete time output signal having a second clock rate that is R times the first clock rate, the system comprising:

means for receiving the input signal; and

means for filtering the input signal with an N -taps finite impulse response (FIR) filter having N filter coefficients according to

$$\sum_{i=k}^{\text{ceil}[(N+1-k)/R]-1} b_{iR-k} u((m-i+k)T_s)$$

wherein b_{iR-k} is one of the N filter coefficients, ~~and~~ $u((m-i+k)T_s)$ is one of the input signal samples, T_s is a slow clock sampling period, m equals (0, 1, 2, 3, ...), and k equals (0, 1, 2, ..., $R-1$).

Claim 6 (original): The system of claim 5, wherein the input signal is a position signal.

Claim 7 (original): The system of claim 5, wherein each of the N filter coefficients is the result of a discrete convolution of a series of FIR filters.

Claim 8 (original): The system of claim 5, wherein the output signal is sent to a control system that controls a photolithography scanning operation.